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ment of the wing, though described from *T. plastographus* applies equally well to the Bruchidæ (*Bruchus* sp.) and to certain of the Buprestidæ as well as to *D. valens*.

With the growth of the wing downward there is a corresponding pushing upward of the invagination at the lower edge thus bringing the wing outside the body, between the hypoderm and the cuticle, while the increase in the size of the body keeps pace with the growth of the wing, so that, although the wing is constantly growing downward and increasing in length, it does not push past the spur or projection in the hypoderm below it until that disappears by the stretching of the hypoderm, late in the prepupal period.

(*To be continued.*)

Class I, HEXAPODA.

Order IV, DIPTERA.

BRIEF NOTES ON MOSQUITO LARVÆ.

BY HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

LARVA OF ANOPHELES BARBERI COQ. — Mr. H. S. Barber originally obtained eggs of this species at Plummer's Island, Md., and turned them over to the Bureau of Entomology, from whence I received them and carried one to the last stage. This was late in the fall and the larvæ were lost over winter. Their actual occurrence was unknown to us. Last summer Mr. F. C. Pratt had the good fortune to discover the larvæ in water in hollow trees at Trapp, Loudon Co., Va. (July 25, 1904). They were taken in charge by Mr. F. Knab, who informs me that in addition to feeding with the mouth brushes in the usual way, the larvæ were predacious, seizing *Culex* larvæ with great activity. This remarkable habit for a larva that can exist on a vegetable diet was observed both by Mr. Knab and Mr. Caudell. Their natural prey are apparently the larvæ of *Culex triseriatus*, *C. signifer* and *C. restuans*, the first two of which inhabit normally hollow trees, the last has been so found by Mr. Pratt.

Larva. — Head elongate, rounded, narrowed before; eye very small, round; antennæ short, not exceeding the mouth, all brown-black. Body as usual, hairs of first two abdominal segments long and branched; the others markedly shorter; dorsal fan shaped tufts present on segments 3-7, but small and with the branches filiform. Air tube sessile, projecting backward over the anal segment, the comb on the side of the eighth segment with 12 long, stout teeth, all practically equal in length without any short ones interpolated. Anal segment with a heavy dark plate reaching half way down the sides: dorsal tuft of four branched hairs, ventral brush of long plumed hairs somewhat curved, the barred area surrounded by a chitinous rim, which runs narrowly to base on ventral line.

VORACITY OF *PSOROPHORA CILIATA* FAB. — Some forty young larvæ of *P. ciliata* were collected from a temporary roadside puddle at Grassymead, Va., together with an equal number of *Culex jamaicensis* on June 11. They devoured all the *jamaicensis* and had begun to eat each other by the next morning. A large culture of *Culex atropalpus* was given them, which they despatched before night of the twelfth and began to eat each other again. As their numbers were being seriously reduced by their cannibalistic habits, they were then separated in jars and fed a mixed culture of *Culex restuans* and *C. pipiens* from a water barrel. Development was very rapid, pupæ being obtained by June 18.

LARVA OF *TENIORHYNCHUS SIGNIPENNIS* COQ. — This species was bred at Laredo, Tex., by Dr. T. D. Berry. The larvæ were found in a puddle two days after a rain, pupæ were formed on the fourth day and imagoes on the fifth. The larvæ are very closely allied to *Culex jamaicensis*, differing only in minor details. Their mode of occurrence and rapid development are likewise similar. As compared with *jamaicensis* the upper two hair tufts of the head are single hairs, not tufts of five or six; the antennæ are all pale whitish, not with the terminal two thirds black; the four spines of the air tube are very basally placed, not remotely spaced to reach nearly half the length of the tube. There are other smaller differences.

OCCURRENCE OF *CULEX AURIFER* COQ. — The note with this heading printed on page 172 of this Journal as in fault, owing to a misreading of Mr. Brakeley's letter. He now writes me that it was the adults, not the larvæ, that occurred in the fore bay (erroneously printed "five boy") of his dam. I have taken the adults sparingly at Weekapaug, R. I., near some cold springs in pasture land, in July. The larvæ had, of course, all disappeared before that date.

SYNONYMY OF *CULEX TRICHURUS* DYAR. — This species has been

redescribed by Messrs. Felt and Young (Science, n. s., xx, 312, 1904), under date of September 2, one day latter than the date of issue of this Journal. They called it *C. cinereoborealis*. Dr. Felt has very kindly transmitted to me a specimen of the larva of his species and there is no doubt of its identity with my *trichurus*.

LARVA OF CULEX PULLATUS COQ.— This is the species called *Culex impiger* in my article on British Columbian mosquitoes (Proc. ent. soc. Wash., vi, 37, 1904), which was the most abundant species at Kaslo, B. C. As noted, the larva is closely allied to *canadensis*, differing only in minor details, whereas the adult is very different. Of the first stage, I made the following description:

Larva, Stage I.— Head elliptical, rounded, the mouth large, quadrate, with well developed brush; eyes elongate elliptical. Thorax rounded, enlarged, abdomen submoniliform, hairs moderately long, single, the lateral ones double on segments 1-4, gradually becoming shorter and weaker posteriorly. Lateral comb of the eighth segment a single row of short, stout, pointed-tipped spines. Air tube three times as long as wide, conical at tip with short, simple basal pecten and hairs beyond. Anal segment with dorsal tuft, paired, two hairs in each half; no ventral brush. Four anal processes longer than the segment.

CULEX ÆSTIVALIS, NEW SPECIES.— I propose this name for the species called *Culex reptans* in my article on British Columbian mosquitoes (Proc. ent. soc. Wash., vi, 38, 1904). It is clearly not the European *reptans* (*nemorosus*), nor is it *lazarensis* Felt & Young, which has a peculiar larva that I had not seen till I examined a specimen kindly sent to me by Dr. Felt. The larva of *æstivalis* is characterized by the air tube being about three times as long as wide, the pecten without detached teeth, followed by the tuft; anal segment almost completely ringed by the plate, the barred area running nearly to the base, two tufts before it practically reaching base; comb of the eighth segment a large patch of thorn-shaped spines fully three rows deep.

SYNONYMY OF CULEX PUNCTOR KIRBY.— As this form has been identified by Mr. Coquillett and myself, it is identical with *Culex abserratus* of Felt & Young (Science, n. s., xx, 312, 1904), as I learn from an examination of their specimens. If we are correct in our identification of Kirby's species, *abserratus* will be cited as a synonym thereof. The larva is characteristic by the smallness of the comb of the eighth segment and the complete encircling of the anal segment by its plate (Journ. N. Y. ent. soc., xii, 169, 1904, pl. ix, fig. 1).

IDENTITY OF *CULEX FITCHII* FELT & YOUNG. — This is the form described as "*cantans* 2" by Mr. Knab and myself (Proc. ent. soc. Wash., vi, 143, 1904). Whether the European *cantans* Meig. really occurs in America at all is a question we are unable to decide at present, and if it does, it is as likely to be *fitchii* as the form "*cantans* 1." European larvæ must be compared.

THE EGGS OF *CULEX TERRITANS* WALKER.

BY FREDERICK KNAB,

URBANA, ILL.

During the summer of 1903, in examining rain-barrels for mosquito material, egg-clusters were several times found upon the sides of the barrel some distance above the surface of the water. At first it was thought that these egg-boats had come into that situation by some disturbance of the water, but later a number of them were found in the same barrel and at different heights from the water — some of them six or eight inches above the water-level. It was also noticed that the longitudinal axis of the cluster was always vertical and there could be no doubt that the eggs were deposited in that situation. These egg-boats were easily detached and when placed in water floated in the ordinary manner of the eggs of *Culex pipiens* and *Culex restuans* and the eggs hatched within a day. The larvæ from these eggs proved to be those of *Culex territans*, which was also the most abundant form in the barrel in question. It may be added that this rain-barrel stood in a large and well-shaded picnic grove and nearby were several small ponds fed by springs where the larvæ of *Culex territans*, and of that species only, were abundant. Upon a previous occasion four egg-boats of *Culex territans* were found at the margin of one of these little ponds. They were under a projecting tussock attached to its base just above the surface of the water. Doubtless the eggs find their way to the surface of the water by some mechanical means and most likely are washed down by a heavy dew or a rain. Probably they do not hatch until they reach the water.

Upon August 16, 1904, it was my good fortune to come upon a mosquito of this species in the act of ovipositing. In the above mentioned grove was a discarded dish-pan partly filled with rain water